January 1999

# Center for Sustainable Agricultural Systems Newsletter, January/ February 1999

# Center for Sustainable Agricultural Systems

## January-February, 1999 Newsletter

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# A Question of Sustainability!

Since I have been in the role of Interim Director of the Center for Sustainable Agricultural Systems, the question has come up in discussions: Should the Center be more appropriately named the Center for Agricultural Systems - deleting the sustainability aspect? My response is no, but I think the question indicates concern in regard to some people's reaction to the word *sustainability*. The dictionary defines sustainable as *to hold up, to keep up*, and *to prolong*. The word brings to individual and public attention the need to continually assess practices, organizations and systems in terms of a sustainable dimension. It often suggests change. Questions regarding sustainability "ring an alarm" with respect to priorities and changes that some would prefer to put off acting upon until a later date, or disregard all together.

There have been several agricultural books and articles that have "rung the alarm" - so to speak - and have received considerable public attention in regard to sustainability issues. Two are discussed below.

In 1957 John Davis and Kenneth Hinshaw, Harvard University, published *Farmer In a Business Suit*. The authors' thesis was that agriculture had transitioned from an earthbound emphasis to one of agribusiness. In order to be economically sustainable, farmers needed to add to their production expertise and stewardship of natural resource responsibilities such tools as financial planning, market analysis, enterprise accounting, and a knowledge of working with contracts. The authors suggested that a business approach to farming, marketing, processing and distribution included new challenges and opportunities - the challenge being sustainable agribusiness systems that are economically, socially, and ecologically/environmentally sound. Davis and Hinshaw portrayed an end to self-sufficiency in farming and the earthbound agriculture era. Rural values tied to the land were challenged. The book stirred up considerable concern and discussion in agricultural and natural resources circles.

A second book that jolted public thinking was Rachel Carson's *Silent Spring* published in 1962. Ms. Carson in a very effective way brought to public attention that the rampant use of chemicals in agriculture had devastating impacts on the food system, human and animal health, and natural resources. People asked: What is she doing? Her intent was to

get public attention, and she did! The assessment of chemicals, a trend toward judicious use, and an increase in organic production approaches followed.

The current issues in the Nebraska and U.S. hog industry are examples of sustainability issues and relate to these two books. Packages of technology are now available whereby mega systems can produce large numbers of hogs at relatively high levels of production and economic efficiency. However, they may not be socially and environmentally acceptable systems. Odor, flies, the potential waste degradation of ground water and streams, and mega operations replacing family-sized operations raise questions in regard to sustainability and compatibility with community values.

Sustainability issues raise immediate concerns and concerns for the future. It is difficult to get public attention regarding future sustainability concerns. The use of fossil fuels as a source of energy is an example. In 1973 crude oil supplies were cut short by an Arab nations' embargo. There were lines at the gasoline pumps and limits on purchases, and efforts to insulate buildings and other conservation measures were initiated. The "energy crisis" got the public's attention - we didn't have a sustainable energy system. In the 1980s research was expedited on alternatives such as fuels from grain, solar power, wind power, and nuclear power. As supplies of crude oil increased, the interest in alternatives decreased. Alternative energy research decreased in priority. With current prices at less than $1/gallon of gasoline, it is once again difficult to get the public's attention that our U.S. crude oil-driven fossil fuel energy base is not sustainable over the long term. Most citizens do not look beyond their life and prefer not to be concerned about long-term issues today. However, driven by environmental and economic sustainability issues, there has been progress with energy efficiency in transportation, with appliances, and in other areas. It is also interesting to note that wind-powered generators are now generating some of Nebraska's electricity.

The word *sustainable* may cause some alarm and may suggest changes such as a reassessment of practices and priorities. Sustainability is a required dimension to systems in agriculture that meet production efficiency, economic, ecological/environmental, and socially acceptable tests. The name of the Center for Sustainable Agricultural Systems is appropriate.

*Submitted by Glen Vollmar*

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# University Role in Biotechnology: How Do We Set Research Priorities?

*First in a Series.* There is growing debate about the emerging role of universities in research and applications of biotechnology. Current interest and investment in production and use of genetically modified organisms (GMOs) have sparked a revolution in university research laboratories and fields. Perhaps no single set of new techniques and

potential technologies has caused such a substantial short-term shift in focus of people and resources in universities. In this series of articles we provide a range of views on the university's role. Included are research priorities, how to measure who will benefit, and sustaining food production and rural communities. We hope that encouraging debate within the university community and among our clients will help inform people of the issues and how we can chart a rational strategy for the future.

# Research Priorities

University researchers set priorities based on how they perceive ways to increase yields, to discover new information through science, or to satisfy their intellectual curiosity. Increasingly, these priorities are set by the availability of research funding. Often an individual's research time, a technician, and facilities in laboratory and field are part of the university infrastructure that is financed by state government with what we call "hard dollars." This annual budget for a project is relatively assured from year to year, providing continuity to research and contributions to the clients in the state and elsewhere. To be able to use this capacity in people and facilities, the researcher must seek grant funds, or "soft dollars," to pay for graduate student salaries, additional travel, supplies and materials, and publications. In an organizational culture that rewards scientists for technical publications, successful students, and ability to attract grant funding, it is likely that modest infusion of grant support from corporations or foundations with vested interests can leverage substantial resources for research by "hungry" scientists.

When this outside research support leads to results that increase productivity, improve efficiency of resource use, or reduce labor by farmers, it can contribute to the goals of the university. Such advances through science have led to more agricultural production and increased income and human well-being on farms and in rural communities. Examples are research financed by seed companies on breeding methods or improved adaptation of hybrids, or by fertilizer companies to find economically optimum rates and timing of application. Others include funds from equipment manufacturers for reduced tillage systems, or herbicide companies to find low-cost weed management options. What these funding sources have in common is a specific product to sell, and confidence that the research results will advance our scientific understanding as well as increase sales. To the extent that such research increases productivity and improves the quality of life on farms and in rural communities, it is consistent with the university mission.

# Other Research Support

Funds to finance research also come from government and private foundation sources. Commodity board grants (e.g., corn or beef check-off funds) most often go to enhance marketing, for new commercial uses, or to improve productivity to resources of labor. In each case they are intended to increase income to farmers or facilitate production and marketing. Other government grants do help broaden the agenda on systems research,

long-term analyses, and other non-commercial directions. Private foundation grants perhaps are the most broad and unique, often directed at social and environmental issues beyond the immediate question of productivity. In each case, the call for proposals will describe in either general or specific terms the focus of the expected research, the types of questions to be answered, and/or the types of impacts that are expected from the work. These sources of funds also influence the direction of research.

# Is Biotechnology Different?

There is no question that the research financed by corporations interested in the products of biotechnology is directed toward technologies that will eventually enhance the bottom line of those organizations. That is the nature of the business. And this is no different in qualitative terms than the fertilizer and equipment companies that want to increase sales by testing and proving that their particular products are better than what the farmer is using today, and better than that of competitors. What is different is the magnitude of the financing that is going into a narrow area of research, the attraction this has for the most gifted scientists and students, and the question of who really benefits from this technology. This latter point will be explored in a subsequent column.

From what we observe in the university environment, the race toward funding for ever more elaborate research in biotechnology is causing a substantial skewing of priorities toward a singular approach to the future. There is strong attraction toward funding for specific laboratory and field research that will benefit an increasingly limited number of commercial firms. The high costs of this technology are passed on to farmers who purchase seeds and the chemicals that are closely packaged to fit with them, and they are limiting the range of decisions that farmers are given. At the same time, there is a move away from systems research, studies that can lead to less expensive biological solutions to weed and pest management, and work that can benefit the environment. The costs of technology increase, and the magnitude of expense and income increases for the individual farmer, while less remains on the farm or in the local community. We also need to look at the current constraints to farm family income and community well-being. If productivity is indeed the limitation, then more research in this direction is important. Yet production stability, net returns to families, health of the landscape and the community, or quality of life for rural residents may not be dependent on higher productivity; in this case the priorities of both researchers and the university should change. As with all outside sources of research support, the funding for biotechnology should be viewed in light of our mission in the university in both research and education. To place such a large emphasis in a single direction seems unwise and counterproductive for the future.

### Next newsletter: Who benefits from new technologies?

*Submitted by Charles Francis and John Allen*

# Highlights of Upcoming Book: *Under The Blade*

This is the fifth in a series of articles that highlight information in a book titled *Under the Blade: The Conversion of Agricultural Landscapes*. Information in this article is from a chapter by Lawrence Libby and Patrick Stewart. Libby is Professor and C. William Swank Chair in Rural-Urban Policy, Department of Agricultural Economics, The Ohio State University. Stewart is Assistant Professor, Department of Political Science, Arkansas State University. Additional authors who contributed chapters in the book are from universities around the country. The book is co-edited by Richard Olson, University of Nebraska and Tom Lyson, Cornell University. For more information, contact Richard Olson at the CSAS office, or e-mail him at csas005@unlvm.unl.edu. To order the book, see the Resources section of this newsletter.

# The Economics of Farmland Conversion

## Cost of Services

Supporters of development often argue that an increase in the tax base is a way to stabilize or even reduce property taxes. However, residential development often costs more in municipal services than it produces in tax revenue.

Table 1. Estimated annual net revenue (taxes minus services) for residential (per housing unit) and business (per 1,000 square feet) development, Monroe County, PA (MCPC 1996).

| **Type of land use** | **Net municipal revenue** | **Net school district revenue** | **Net county revenue** | **Local government total** |
|---|---|---|---|---|
| Single-family detached | - $121 | - $1,439 | + $110 | - $1,450 |
| Attached or multifamily | - $167 | - $244 | + $27 | - $384 |
| Office | + $35 | + $991 | + $65 | + $1,091 |
| Factory | + $38 | + $411 | + $3 | + $452 |

Table 2. Ratios of revenues to service costs for different land uses in four midwestern communities (AFT 1993, 1994).

| City | Residential | Commercial and industrial | Farmland |
|---|---|---|---|
| | 1 : 1.02 | 1 : 0.79 | 1 : 0.77 |
| Lake Elmo, MN | 1 : 1.07 | 1 : 0.20 | 1 : 0.27 |
| Independence, MN | 1 : 1.03 | 1 : 0.19 | 1 : 0.47 |
| Madison Township, OH | 1 : 1.54 | 1 : 0.23 | 1 : 0.34 |

Conversion of farmland to development increases the need for roads, police, waste disposal, and other municipal services. Particularly due to the cost of education, residential development often pays less in taxes than it requires in services. Commercial and industrial development more than pays for its required services. Farmland, which requires very few services, also provides a surplus of tax revenue to local government.

The total cost to a municipality of farmland development depends in part on the final mix of land uses. Also, more expensive homes generate more revenue. A study in Palm Beach County, Florida estimates that a new rural home worth $750,000 will pay enough taxes to cover its services, while less expensive homes add to the county tax burden (Engelhardt 1997). Construction of 25,800 homes in the county's Agricultural Reserve would cause an estimated $1.36 billion drain on taxpayers during 50 years, even with developers paying for some of the roads and other infrastructure.

# Competition for Land

Studies at the urban edge uniformly show a large difference between the price that conventional farmers can afford to pay for land for agricultural use, and the price that a developer can afford to offer. For example:

- A dryland corn/soybean farmer in Lancaster County, NE might realistically pay $1,500 to $2,000 per acre for good farmland, while developers are paying $10,000 to $25,000 per acre for land near the boundary of the city of Lincoln.
- Rocky Mountain ranchland, valued at $1,500 to $2,000 per animal unit (the amount of rangeland required to support a cow-calf pair), sells for two to ten times that amount for ranchette development.
- In southern Ventura County, CA, land acquisition costs must be below $10,000 per acre for a citrus operation to produce a profit. Actual acquisition prices near urban expansion areas are $25,000 to $35,000 per acre.

In some regions, intensive production of specialty vegetables or other niche crops can gross $10,000 or more per acre and a farmer could potentially outbid developers for small

amounts of land. But given the low prices received for most agricultural products, it is impossible for most types of conventional agriculture to compete for land with residential or commercial development in the absence of citizen actions to remove the economic differential. For example, agricultural zoning or the purchase of development rights help to maintain agriculture in areas facing development pressure by removing development as a legal option, and proper estate planning can enable the transfer of farmland between generations, denying developers the opportunity to bid.

**References:**

AFT. 1993. The Cost of Community Services in Madison Village and Township, Lake County, Ohio. American Farmland Trust, Washington, D.C.

AFT. 1994. Farmland and the Tax Bill: The Cost of Community Services in Three Minnesota Cities. American Farmland Trust, Washington, D.C.

Engelhardt, J. 1997. Palm Beach County relied on faulty figures for cost of growth, experts say. The Palm Beach Post, November 19, p. 10A.

MCPC. 1996. Fiscal Alert. Monroe County Planning Commission, Stroudsburg, PA.

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# Global Perspectives on Biotechnology

# (or)

# What's This Farm Boy Doing in Brussels?

Early last spring I received a call from Dr. Margaret Mellon asking if I would be interested in attending a meeting on some of the issues surrounding biotechnology to be held in Brussels, Belgium. It was scheduled for after oat planting and before we got busy with corn planting, so I said yes, tentatively. I wanted to get a little background on the people who were sponsoring the meeting before I gave a firm commitment. My wife, Deb, got on the Internet and found out about the Charles Leopold Mayer Foundation for the Progress of Humankind. It seemed similar to the Keystone group here in the U.S. in that it brings both sides of an issue to the table. I liked that. The value of the meeting is not in the effort to draw some conclusion(s), but in the dialogue that develops.

I thought - sounds like a group that truly wants to do some good, but why ask me to attend? It seems they wanted some representation from the scientific community (Dr. Mellon) and a "typical" grain and livestock farmer from the Midwest.

I felt I could contribute to the discussion from the viewpoint of a conventional farmer, sustainable farmer, and certified organic farmer, as I had been operating as one of these over the past 20 years or so.

As a participant at this meeting, I was asked to present a short paper on "Perspectives on Genetically Modified Organisms (GMOs) and Their Relationships to Society and Agriculture." What a title! I've evidently been spending too much of my free time rubbing elbows with academia. Briefly, the areas I tried to cover were: innovation, research, patents, in the field, agricultural system evolution, non-GMO products, and agribusiness influences. Just the thing you want to dig into after a heavy noon lunch! Well, I did my research (read, think, ask others) and was off to Brussels.

Upon arrival participants were given a document to sign that stated they would not quote anyone's comments during the meeting. The Foundation wanted to assure a free exchange of ideas and opinions. Lawyers, journalists, environmentalists, scientists, farmers, public policy makers and interpreters were in attendance. Signing this document meant that they did not have to be concerned about their reputations, positions, or careers. Believe you me, it worked! I didn't see anyone throw anything or see bulging veins on people's foreheads, but the exchanges became quite lively at times. Also, I sensed that some of the "opposing sides" found common ground at times.

I can speak in general terms about the topics that were discussed, which included vertical integration and consolidation in the industry worldwide. The ethical aspect of GMOs assumes that people must eat what is provided. What happens to issues of choice?

The ramifications of "Terminator" technology was a hot topic, especially as it related to developing nations. The technology of genetic engineering places the company at a "greater distance" relationally from the farmer, sometimes even in an adversarial role.

The narrowing of the germ plasm base and companies' unwillingness to share their developments presents new obstacles to publically-funded research. The legal and patent issues were discussed as well as how multinationals fit in this arena.

Transparency was a term the Europeans used for traceability, or in other words - How do consumers know exactly what their food is and how it was produced?

It was an interesting exchange, not only because it was simultaneously interpreted in English and French, but also for the approach taken. I kept thinking, "Maybe this is what *comprehensive* government is like. In the U.S. we tend to make rules and laws and then try to deal with the mess we created. This approach seems to deal with the messy stuff first in an effort to make rules and laws that are not only fair but just."

*Submitted by Tom Larson, farmer, St. Edward, NE*

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# NCR SARE Producer Grants Available

The USDA's Sustainable Agriculture Research and Education (SARE) program in the North Central Region (NCR) invites producers to apply for competitive grants to research, demonstrate or educate others about profitable, environmentally sound, socially responsible agricultural systems.

A total of $250,000 is available for grants of up to $5,000 for individual producers and up to $15,000 for groups of three or more producers investigating any sustainable practice or concept. Additional funding specifically earmarked for agroforestry projects is also available as a result of a National Agroforestry Center initiative.

Past projects covered a variety of topics such as reducing off-farm inputs, improving water quality, educating young people or consumers about agriculture, managing weeds and pests, and creating viable markets for sustainable products.

Producers must reside in IL, IN, IA, KS, MI, MN, MO, NE, ND, OH, SD, WI. Applications are due April 30, 1999. Funding decisions will be made in late-June 1999. Funds will be available in mid-fall for the 2000 crop production season. For application materials or questions, call the NCR SARE office, 402-472-7081, fax 402-472-0280, or send e-mail to sare001@unlvm.unl.edu for an application, http://www.sare.org/ncrsare/.

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# Resources

*Under the Blade: The Conversion of Agricultural Landscapes*. $25. This new (December 1998) book edited by Richard Olson (U. of Nebraska) and Thomas Lyson (Cornell U.) examines the patterns, causes and consequences of current land use decisions in the U.S. It examines farmland loss from several perspectives, and then integrates the results into policy recommendations (see related article in this newsletter). Westview Press, 5500 Central Ave., Boulder, CO 80301-2877, 303-444-3541. To order a $5 course examination copy, call 1-800-386-5656.

*America's Animal Factories: How States Fail to Prevent Pollution from Livestock Waste*, December 1998. $10 + $3 s&h. Includes state reports for 31 states, including Nebraska. NRDC Publications Department, 40 West 20th Street, New York, NY 10011. Online at http://www.nrdc.org/nrdcpro/fppubl.html.

The National Library for the Environment Web site contains Congressional Research Reports, http://www.cnie.org/nle/. Choose Agriculture for the topic and you'll find, for example, recent reports on such topics as grazing fees and rangeland management, animal waste management and the environment, and changes in U.S. farm income.

New farmer direct marketing Web page for small and medium-sized producers, http://www.ams.usda.gov/directmarketing.

ATTRA has 38 downloadable informational packets on the World Wide Web at http://www.attra.org/topub.html. Topic areas are Fundamentals of Sustainable Agriculture, Agronomy, Horticulture, Livestock, Pest Management, Soil and Fertility, Marketing & Business, and Alternative Farming Systems. The latest edition of the ATTRA Materials List that describes all of ATTRA's standard materials is also available.

Considering a non-traditional livestock enterprise? Check out the Nebraska Cooperative Extension Livestock Specialty Enterprises Web page containing information and links on bison, goats, llamas, rabbits, ostriches and emus, and aquaculture, http://www.ianr.unl.edu/ianr/lanco/ag/livestok/livespec.htm.

*Community Food Security News*. Varying rates. Quarterly newsletter promotes comprehensive systems-oriented solutions to the nation's food and farming problems. Community Food Security Coalition, PO Box 209, Venice, CA 90294, 310-822-5410, asfisher@aol.com.

*Working Trees for Livestock*. Free. Brochure describes specific ways your land can benefit by putting trees to work for your livestock. This is only one of many excellent publications available from the National Agroforestry Center, USDA-FS/USDA-NRCS, East Campus - UNL, Lincoln, NE 68583-0822, 402-437-5178, ext. 11, http://www.unl.edu/nac.

*Trouble on the Farm: Growing Up with Pesticides in Agricultural Communities*. $10.50 + $3 s&h. Natural Resources Defense Council report discusses how children who live on or near agricultural land, or whose families work in the fields, are "likely to be the most pesticide-exposed subgroup in the United States." NRDC Publications Department, 40 West 20th St., New York, N.Y. 10011.

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# Coming Events

Contact CSAS office for more information.

**1999**

Feb. 27 - Annual Meeting of Nebraska Sustainable Agriculture Society, Aurora, NE, http://www.netins.net/showcase/nsas/

Mar. 4-6 - Upper Midwest Organic Farming Conference, Sinsinawa, WI

Mar. 8-10 - Annual Nebraska Water Conference, Kearney, NE

June 6-8 - National Agricultural Biotechnology Council Meeting - World Food Security and Sustainability: The Impacts of Biotechnology and Industrial Consolidation, Lincoln, NE

June 12-16 - 6th Conference on Agroforestry in North America: Sustainable Land-Use Management for the 21st Century, Hot Springs, AR, tclason@agctr.lsu.edu http://www.missouri.edu/~afta/Sixth_Conf.html

June 14-16 - XXVIII International Congress Work Sciences in Sustainable Agriculture, Horsens, Denmark, http://www.sp.dk/~cgs/ciosta/

Oct. 12-15 - Second National Small Farm Conference: Building Partnerships for the 21st Century, St. Louis, MO

Oct. 20-23 - North American Chapter Association for Farming Systems Research and Extension (AFSR/E) Biennial Meeting - Sustaining Agriculture in the 21st Century: Thinking "Outside the Box," Guelph, Ontario, CA, http://www.oac.uoguelph.ca/FSR/ (abstracts due Apr. 1)

For additional events, see:

http://www.sare.org/wreg/view_notice_adm.pl

http://www.agnic.org/mtg/

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# Did You Know...

On 11/30/98 the Organic Trade Association released a study containing results of a survey of 56 food manufacturers who use organic ingredients. The study showed that, on average, sales increased 36% from 1996 to 1997. The OTA estimates the organic foods industry to have $4.2 billion in annual sales, with $6.6 billion expected by the year 2000.

On 10/30/98 CGIAR (16 agricultural research institutes throughout the world) issued a statement that they won't use "terminator" seeds.

Only 40% of grain farmers nationwide see themselves farming 5 years from now according to a recent poll commissioned by Nebraska Farmers Union, the Nebraska Wheat Growers Association, the National Farmers Union, and the American Corn Growers Association.

USDA's 1998 updated farmers market directory lists 2,746 farmers markets operating in the U.S., up from 2,410 in 1996 and 1,755 in 1994, when USDA began collecting the data. That's a 56% increase in four years. For information on these markets, see http://www.ams.usda.gov/farmersmarkets/.

A 12/28/98 article in the *Omaha World Herald* reported that researchers at the University of Iowa recently found an unusually high rate of respiratory problems among people who lived near a 4,000-sow hog confinement facility. Studies in North Carolina, the Iowa study, and research in Minnesota all have found cause for concern.

Land trusts and conservancies in the U.S. (now 1,213 of them actively buying land and brokering "conservation easements" from private owners) have preserved 5 million acres, more than twice the amount of just 10 years ago, according to the Washington-based Land Trust Alliance. That doesn't include 10 million acres preserved by the "nationals," organizations that have long specialized in wildlife or farmland protection.

The Clinton administration proposed many environmental initiatives in January. One is the use of tax credits to finance nearly $10 billion in special "green bonds" that would be used to preserve open space, create community parks and preserve farmland. The proposal, which envisions $700 million in tax credits over 5 years, is part of a $1 billion-a-year program to promote "smart growth" strategies and stem suburban sprawl. The initiative will be part of the fiscal 2000 budget Clinton will send to Congress in February.

On 1/14/99 Glickman announced that certain meat and poultry products will be allowed to carry a label indicating that they are certified organic. For details see http://www.fsis.usda.gov/OA/news/pr_orglab.htm.

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